

AUTHOR(S): Okuhara, Kunio  
 CORPORATE SOURCE: Gov. Ind. Res. Inst., Nagoya, Japan  
 SOURCE: Journal of Organic Chemistry (1978), 43(14), 2745-9  
 CODEN: JOCEAH; ISSN: 0022-3263

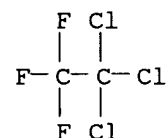
DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB In the reaction of CF<sub>2</sub>ClCFCl<sub>2</sub> with AlCl<sub>3</sub>, the addn. of CS<sub>2</sub>, Cl<sub>2</sub>C:CHCl, CH<sub>2</sub>Cl<sub>2</sub>, n-hexane, cyclohexane, etc., effectively inhibited the isomerization into CF<sub>3</sub>CCl<sub>3</sub> without significantly retarding substitution, which gives CF<sub>2</sub>ClCCl<sub>3</sub>. Cyclohexane was also used similarly to obtain CF<sub>3</sub>CClBr<sub>2</sub> from CF<sub>3</sub>CFBr<sub>2</sub>, CF<sub>2</sub>BrCCl<sub>2</sub>Br from CF<sub>2</sub>BrCFClBr, CF<sub>2</sub>BrCClBr<sub>2</sub> from CF<sub>2</sub>BrCFClBr (with AlBr<sub>3</sub>), and CF<sub>2</sub>ClCBrCl<sub>2</sub> from CF<sub>2</sub>ClCFCl<sub>2</sub> (with AlBr<sub>3</sub>). In each of these reactions cyclohexane-methylcyclopentane equilibration as well as formation of a small amt. of a hydride-transfer product, such as CF<sub>2</sub>ClCHCl<sub>2</sub>, was noted. In the treatment of CF<sub>2</sub>ClCFCl<sub>2</sub> with AlCl<sub>3</sub>, the isomerization was inhibited by vigorous stirring, discontinuation of which afforded **aluminum fluoride** ppts. which catalyze the isomerization of fluorohalocarbons. Reactions of CF<sub>2</sub>ClCFCl<sub>2</sub> with Al halides in the presence of halomethanes and similar reactions of CF<sub>2</sub>BrCFClBr were also studied. The substitution reaction is considered to proceed in soln. via the ion pair CF<sub>2</sub>ClC+Cl<sub>2</sub> AlFL-3 without rearrangement, while the isomerization is considered predominantly a surface reaction.

IT 354-58-5P  
 RL: SPN (Synthetic preparation); **PREP (Preparation)**  
 (prepn. of)

RN 354-58-5 CAPLUS

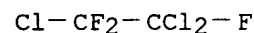
CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 76-13-1  
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)  
 (substitution reaction of, with aluminum chloride, isomerization inhibition in, by additives)

RN 76-13-1 CAPLUS

CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME)



=> sel rn 4  
 E1 THROUGH E12 ASSIGNED

=> file caplus  
 COST IN U.S. DOLLARS  
 FULL ESTIMATED COST

SINCE FILE	TOTAL
ENTRY	SESSION
40.55	81.56

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)  
 CA SUBSCRIBER PRICE

SINCE FILE	TOTAL
ENTRY	SESSION
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FILE LAST UPDATED: 24 Mar 2003 (20030324/ED)

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COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	0.42	81.98
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
	ENTRY	SESSION
CA SUBSCRIBER PRICE	0.00	-3.26

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STRUCTURE FILE UPDATES: 24 MAR 2003 HIGHEST RN 500530-01-8  
DICTIONARY FILE UPDATES: 24 MAR 2003 HIGHEST RN 500530-01-8

TSCA INFORMATION NOW CURRENT THROUGH MAY 20, 2002

Please note that search-term pricing does apply when conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP PROPERTIES for more information. See STNote 27, Searching Properties in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

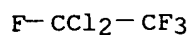
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1 127-18-4/BI  
(127-18-4/RN)  
1 1333-82-0/BI  
(1333-82-0/RN)  
1 354-58-5/BI  
(354-58-5/RN)  
1 374-07-2/BI

(374-07-2/RN)  
L9 4 (127-18-4/BI OR 1333-82-0/BI OR 354-58-5/BI OR 374-07-2/BI)

=> d scan

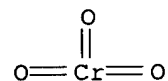
L9 4 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Ethane, 1,1-dichloro-1,2,2,2-tetrafluoro- (9CI)  
MF C2 Cl2 F4  
CI COM



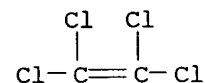
\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):3

L9 4 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Chromium oxide (CrO3) (8CI, 9CI)  
MF Cr O3  
CI COM

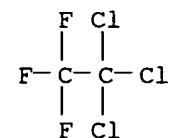


L9 4 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Ethene, tetrachloro- (9CI)  
MF C2 Cl4  
CI COM



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

L9 4 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI)  
MF C2 Cl3 F3  
CI COM



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

ALL ANSWERS HAVE BEEN SCANNED

=> s 354-58-5/prep  
 595 354-58-5  
 2981417 PREP/RL  
 L1 59 354-58-5/PREP  
 (354-58-5 (L) PREP/RL)

=> s 11 and (fixed bed or fluidized bed)  
 178846 FIXED  
 141637 BED  
 58505 BEDS  
 163038 BED  
 (BED OR BEDS)  
 16370 FIXED BED  
 (FIXED(W)BED)  
 61267 FLUIDIZED  
 1 FLUIDIZEDS  
 61267 FLUIDIZED  
 (FLUIDIZED OR FLUIDIZEDS)  
 141637 BED  
 58505 BEDS  
 163038 BED  
 (BED OR BEDS)  
 54040 FLUIDIZED BED  
 (FLUIDIZED(W)BED)  
 L2 0 L1 AND (FIXED BED OR FLUIDIZED BED)

=> s 11 and bed  
 141637 BED  
 58505 BEDS  
 163038 BED  
 (BED OR BEDS)  
 L3 2 L1 AND BED

=> d ibib abs 1-2

L3 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2003 ACS  
 ACCESSION NUMBER: 1994:54198 CAPLUS  
 DOCUMENT NUMBER: 120:54198  
 TITLE: Preparation of trifluoroacetyl chloride by oxidation  
 of 1,1-dichloro-2,2,2-trifluoroethane with molecular  
 oxygen over carbon bed  
 INVENTOR(S): Jacobson, Stephen E.  
 PATENT ASSIGNEE(S): du Pont de Nemours, E. I., and Co., USA  
 SOURCE: U.S., 3 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5241113	A	19930831	US 1992-945192	19920915
WO 9406744	A1	19940331	WO 1993-US8252	19930909
W: JP				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 660817	A1	19950705	EP 1993-920458	19930909
R: BE, DE, FR, GB				
JP 09502160	T2	19970304	JP 1993-508106	19930909
PRIORITY APPLN. INFO.:			US 1992-945192	19920915

AB A process for the continuous prodn. of trifluoroacetyl chloride which comprises passing a mixt. of 1,1-dichloro-2,2,2-trifluoroethane and mol. oxygen over a carbon bed maintained at a temp. from 200-325.degree. is claimed.

L3 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1987:638901 CAPLUS  
 DOCUMENT NUMBER: 107:238901  
 TITLE: Process for fluorinating halogenated organic compounds  
 INVENTOR(S): Fujioka, George S.  
 PATENT ASSIGNEE(S): Dow Chemical Co., USA  
 SOURCE: U.S., 8 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4680406	A	19870714	US 1985-787190	19851015
PRIORITY APPLN. INFO.:			US 1985-787190	19851015
OTHER SOURCE(S):			CASREACT 107:238901	

AB Halogenated org. compds. are fluorinated in a process comprising injecting HF into a liq. pool of halogenated aliph. or arom. reactant, removing a volatilized mixt. of the reactant and HF, passing the mixt. over a catalyst bed to facilitate formation of a F-contg. compd., and recovering the F-contg. compd. from the catalyst bed. An app. used for fluorination comprised a source of HF, a vessel for holding a liq. pool of feeder reactant, a means for injecting HF from the source into the reactant pool and for removing a fraction of the reactant which is volatilized and mixed with HF, a catalyst bed communicating with the vessel to receive the mixed reactant and HF and to effect formation of F-contg. compds., and a means for recovering the F-contg. compds. from the catalyst bed. Liq. 2,3-dichloro-5-(trichloromethyl)pyridine (I) at 194-204.degree. was fluorinated in such a reactor using HF-I molar ratio 3.6:1 and 9 s residence time (247.degree.), forming a mixt. of 2,3-difluoro-5-(trifluoromethyl)pyridine 0.09, 3-chloro-2-fluoro-5-(trifluoromethyl)pyridine 12.80, 3-chloro-5-(chlorodifluoromethyl)-2-fluoropyridine 0.20, 2,3-dichloro-5-(trifluoromethyl)pyridine 72.40, 2,3-dichloro-5-(chlorodifluoromethyl)pyridine 12.90, and 2,3-dichloro-5-(dichlorofluoromethyl)pyridine 0.50%.

=> s fixed bed or fluidized bed

178846 FIXED  
 141637 BED  
 58505 BEDS  
 163038 BED  
 (BED OR BEDS)  
 16370 FIXED BED  
 (FIXED(W) BED)  
 61267 FLUIDIZED  
 1 FLUIDIZEDS  
 61267 FLUIDIZED  
 (FLUIDIZED OR FLUIDIZEDS)  
 141637 BED  
 58505 BEDS  
 163038 BED  
 (BED OR BEDS)

```

54040 FLUIDIZED BED
      (FLUIDIZED(W)BED)
L4    68897 FIXED BED OR FLUIDIZED BED

=> s l4 and alumnium fluoride
      19 ALUMNIUM
      214877 FLUORIDE
      39599 FLUORIDES
      229008 FLUORIDE
            (FLUORIDE OR FLUORIDES)
      0 ALUMNIUM FLUORIDE
            (ALUMNIUM(W)FLUORIDE)
L5    0 L4 AND ALUMNIUM FLUORIDE

=> s l4 and (aluminum fluoride or alf3)
      767020 ALUMINUM
      284 ALUMINUMS
      767080 ALUMINUM
            (ALUMINUM OR ALUMINUMS)
      214877 FLUORIDE
      39599 FLUORIDES
      229008 FLUORIDE
            (FLUORIDE OR FLUORIDES) .
      6513 ALUMINUM FLUORIDE
            (ALUMINUM(W)FLUORIDE)
      7029 ALF3
L6    92 L4 AND (ALUMINUM FLUORIDE OR ALF3)

=> s al?/ti and l6
      1934094 AL?/TI
L7    52 AL?/TI AND L6

=> d ti 1-5

L7    ANSWER 1 OF 52  CAPLUS  COPYRIGHT 2003 ACS
TI    Process for preparing aluminum fluoride by
      fluorination of alumina

L7    ANSWER 2 OF 52  CAPLUS  COPYRIGHT 2003 ACS
TI    Property of AlF3 catalysts prepared by fluorination of
Al2O3 with HF

L7    ANSWER 3 OF 52  CAPLUS  COPYRIGHT 2003 ACS
TI    Manufacture of granules of reactive metals or alloys by
      melt-droplet quenching in a fluidized bed

L7    ANSWER 4 OF 52  CAPLUS  COPYRIGHT 2003 ACS
TI    Industrial experiments of AlF3 fluidized bed .
      coolers

L7    ANSWER 5 OF 52  CAPLUS  COPYRIGHT 2003 ACS
TI    Fluidized-bed process for cleaning and melting of
aluminum scrap contaminated with organics

=> d ibib abs 45-52

L7    ANSWER 45 OF 52  CAPLUS  COPYRIGHT 2003 ACS
ACCESSION NUMBER:      1964:402277  CAPLUS
DOCUMENT NUMBER:       61:2277
ORIGINAL REFERENCE NO.: 61:334d-e
TITLE:                 Dehydration of aluminum fluoride

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hydrates  
 INVENTOR(S): Schmidt, Alfred; Weinrotter, Ferdinand  
 PATENT ASSIGNEE(S): Lentia G.m.b.H.  
 SOURCE: 2 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 1166754		19640402	DE	
PRIORITY APPLN. INFO.:			AT	19600218

AB Air streams heated in a fluid bed of **AlF3** will remove the water of hydration from **AlF3** hydrates if the contact time is limited to <1 sec. to prevent decompn. Higher than monohydrates can be dehydrated in steps. For example, a reactor with a fluid bed of anhyd. **AlF3** 70 mm. in diam. and 150 mm. high is heated externally to 590.degree., while 80 l. air/hr. is passed through. A solid recirculation system feeds 1000 g. **AlF3**.3H2O over a 1-hr. period into this bed. **AlF3** of 99.6% purity is produced with negligible decompn.

L7 ANSWER 46 OF 52 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1964:58597 CAPLUS  
 DOCUMENT NUMBER: 60:58597  
 ORIGINAL REFERENCE NO.: 60:10248a-c  
 TITLE: Fluoride of **aluminum** as a by-product of superphosphate manufacture  
 AUTHOR(S): Weinrotter, F.  
 SOURCE: Chem. Age India (1963), 14(8), 598-9  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

AB H2SiF6 (15-23%) can be obtained from the tail gases of superphosphate plants with recovery of 12% of the total F as H2SiF6. The addn. of 1% hydrated silicic acid is sufficient for optimum yields. The most suitable concn. of H2SiF6 is 10-17 wt.% for **AlF3** prepn., with P2O5 of the acid .gtoreq.200-300 mg./l. The supersatd. soln. of **AlF3** is prepd. by treating the H2SiF6 with the Al(OH)3.nH2O for 15 min. The pptd. H2SiF6 is sepd. by a centrifugal hydroextractor in 8-10 min., inclusive of wash time. The product contains 40% water and the **AlF3** (about 5% by wt.) is not removable by washing. The **AlF3** soln. is metastable. Left to itself, the .beta.-**AlF3**.3H2O crystallizes within 3-6 days as a hard incrustation. The addn. of seeding crystals, stirring, and 95.degree. temp. during crystn. are necessary. Then 7-10% of the total **AlF3** remains in soln. in the mother liquor, which is recirculated in the tail-gas washers. The **AlF3**.3H2O is then calcined in a two-level **fluidized bed** furnace. The natural overflow of the first level product operating at 240.degree. with 6% water is completely dehydrated at about 600.degree. to <0.3% water on the 2nd level. The finished overflow product is finely crystd. and bagged immediately after a simple air cooling.

L7 ANSWER 47 OF 52 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1963:45025 CAPLUS  
 DOCUMENT NUMBER: 58:45025  
 ORIGINAL REFERENCE NO.: 58:7637e  
 TITLE: **Aluminum fluoride** manufacture  
 INVENTOR(S): Papp, Roger; Robert, Georges  
 PATENT ASSIGNEE(S): Societe d'Electro-Chimie, d'Electro-Metallurgie et des Acieries Electriques d'Ugine  
 SOURCE: 5 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable



PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	FR 1309300		19621116	FR	19611002
	GB 1016894			GB	
AB	In a process for the manuf. of <b>AlF3</b> , partially dehydrated alumina contg. 64-90% Al2O3 is made to react with H2F2 in a fluidized process with superimposed <b>fluidized beds</b> , Al2O3 being introduced from the top and H2F2 through the 1st and 2nd bottom of the beds.				

L7 ANSWER 48 OF 52 CAPLUS COPYRIGHT 2003 ACS  
 ACCESSION NUMBER: 1963:25421 CAPLUS  
 DOCUMENT NUMBER: 58:25421  
 ORIGINAL REFERENCE NO.: 58:4201h,4202a  
 TITLE: Dehydration of **aluminum fluoride** hydrates  
 PATENT ASSIGNEE(S): Osterreichische Stickstoffwerke A.-G.  
 SOURCE: 3 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 PATENT INFORMATION:

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
	GB 911837		19621128	GB	
PRIORITY APPLN. INFO.:				AT	19600218
AB	<b>AlF3</b> hydrate is dehydrated by <b>fluidized bed</b> calcination or by sluicing the hydrates into a current of air or gas in tube system. In an externally heated container at 590.degree., 80 l. air/hr. were supplied from below to maintain a <b>fluidized bed</b> of anhyd. <b>AlF3</b> of 70 mm. diam. .times. 150 mm. height in the expanded state. <b>AlF3.3H2O</b> (1000 g.) at 20.degree. were continuously introduced in 1 hr. at the head of the fluidization app. The dehydrated product, which was withdrawn by means of an overflow, contained 0.2% H2O and 67.5% F.				

L7 ANSWER 49 OF 52 CAPLUS COPYRIGHT 2003 ACS  
 ACCESSION NUMBER: 1962:409294 CAPLUS  
 DOCUMENT NUMBER: 57:9294  
 ORIGINAL REFERENCE NO.: 57:1853c-e  
 TITLE: Manufacture of **alkali-free** corundum of tabular crystal form  
 AUTHOR(S): Locsei, Bela  
 CORPORATE SOURCE: Central Res. Inst. Building Material, Budapest, Hung.  
 SOURCE: Nature (1962), 194, 177-8  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 AB The steam hydrolysis of **AlF3** above 800.degree. produces **alkali-free** tabular .alpha.-corundum, along with substantial quantities of AlOF. F content of the product mixt. varies from 4.0 to 4.8%, depending on the temp. HF formed in the reaction may be used for the manuf. of **AlF3** from Al hydroxide or hydrate below 300.degree.. Two vertical fluidizing ovens, 1 above the other, are used for recirculation of the HF. In the lower oven, **AlF3** is fluidized with steam above 800.degree.. Tabular .alpha.-Al2O3 and HF leave the unit. The HF may be introduced directly into the other oven, in which Al hydroxide or hydrate is fluidized at 250-80.degree.. **AlF3** produced in this unit may be used in the lower unit for the production of tabular .alpha.-Al2O3. The fluid reaction system offers relatively low investment costs with high capacity, continuous operation, uniform heat distribution in the bed, high

heat-transmission rate, simple app., and low labor requirement.

L7 ANSWER 50 OF 52 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1961:146646 CAPLUS

DOCUMENT NUMBER: 55:146646

ORIGINAL REFERENCE NO.: 55:27805e-f

TITLE: Drying of **aluminum fluoride**  
hydrates

INVENTOR(S): Schmidt, Alfred; Weinrotter, Ferdinand

PATENT ASSIGNEE(S): Osterreichische Stickstoffwerke Akt.-Ges.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
AT 217009		19610911	AT	

AB **AlF3** hydrates are dried without F losses by heating the hydrate within a few sec. to the final temp. of the desired degree of dehydration. Rapid heating is effected by a **fluidized bed** process, by introducing the hydrate in a circulating gas or air stream, or by direct or indirect heating of the material in a rotating furnace.

L7 ANSWER 51 OF 52 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1958:90037 CAPLUS

DOCUMENT NUMBER: 52:90037

ORIGINAL REFERENCE NO.: 52:15854b-c

TITLE: **.alpha.-Alumina**

INVENTOR(S): Roberts, Elliot J.; Jukkola, Walfred W.

PATENT ASSIGNEE(S): Dorr-Oliver Inc.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 2833622		19580506	US	
GB 878827			GB	

AB To produce **.alpha.-Al2O3**, hydrated **Al2O3** is treated by countercurrent gas-solids flow in a series of **fluidized beds** with an **AlF3** catalyst at 1600-2000.degree.F.

L7 ANSWER 52 OF 52 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1952:33994 CAPLUS

DOCUMENT NUMBER: 46:33994

ORIGINAL REFERENCE NO.: 46:5795h-i

TITLE: **Aluminum fluoride**

INVENTOR(S): Edwards, Arnold J.

PATENT ASSIGNEE(S): National Smelting Co., Ltd.

DOCUMENT TYPE: Patent

LANGUAGE: Unavailable

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
GB 656374		19510822	GB	

AB **AlF3** is prepd. by passing gaseous HF upward through a **fluidized bed** of particles of **Al2O3** and **Al(OH)3** at 350-650.degree., the heat required for raising the temp. being wholly

derived from the reaction itself if the mixt. contains a major portion of  $\text{Al}_2\text{O}_3$ . When a considerable proportion of  $\text{Al}(\text{OH})_3$  is present, addnl. heat is supplied by burning fuel. The reaction may be performed batchwise, but preferably is conducted in two or more stages. The beds of the aluminous material are superimposed, and the gas is passed in series up through them, while the aluminous material overflows from each bed to the one below.

=> d his

(FILE 'HOME' ENTERED AT 05:50:59 ON 26 MAR 2003)

FILE 'REGISTRY' ENTERED AT 05:51:07 ON 26 MAR 2003

FILE 'CAPLUS' ENTERED AT 05:51:21 ON 26 MAR 2003

L1 59 S 354-58-5/PREP  
L2 0 S L1 AND (FIXED BED OR FLUIDIZED BED)  
L3 2 S L1 AND BED  
L4 68897 S FIXED BED OR FLUIDIZED BED  
L5 0 S L4 AND ALUMNIUM FLUORIDE  
L6 92 S L4 AND (ALUMINUM FLUORIDE OR ALF3)  
L7 52 S AL?/TI AND L6

=> s l6 not l7

L8 40 L6 NOT L7

=> d ti

L8 ANSWER 1 OF 40 CAPLUS COPYRIGHT 2003 ACS  
TI Method of siliconizing of steel articles in **fluidized bed**

=> s fluor? and l8

936538 FLUOR?

L9 32 FLUOR? AND L8

=> d ti 1-10

L9 ANSWER 1 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Method of siliconizing of steel articles in **fluidized bed**

L9 ANSWER 2 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Method of boron-nickel plating of steel parts in **fluidized bed**

L9 ANSWER 3 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Smelting solution - creating useful materials from toxic waste

L9 ANSWER 4 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI The Spent Pot Lining treatment and **fluoride** recycling project

L9 ANSWER 5 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Removing **fluorine** from semiconductor processing exhaust gas

L9 ANSWER 6 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Process for preparation of 1,1,1,3,3-pentafluoropropane

L9 ANSWER 7 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Catalyst application in carbonaceous materials production by pyrolysis and

coking processes

L9 ANSWER 8 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI The new Ausimont process for production of hydrochlorofluorocarbons and hydrofluorocarbons: new products resulting from the Montreal Protocol

L9 ANSWER 9 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Steam generation in a steam-utilizing process

L9 ANSWER 10 OF 32 CAPLUS COPYRIGHT 2003 ACS  
TI Method of recovering acid catalyst from acid catalyzed processes

=> s fixed bed and fluidized bed  
178846 FIXED  
141637 BED  
58505 BEDS  
163038 BED  
(BED OR BEDS)  
16370 FIXED BED  
(FIXED(W) BED)  
61267 FLUIDIZED  
1 FLUIDIZEDS  
61267 FLUIDIZED  
(FLUIDIZED OR FLUIDIZEDS)  
141637 BED  
58505 BEDS  
163038 BED  
(BED OR BEDS)  
54040 FLUIDIZED BED  
(FLUIDIZED(W) BED)  
L10 1513 FIXED BED AND FLUIDIZED BED

=> s l10 and (aluminum fluoride or alf3)  
767020 ALUMINUM  
284 ALUMINUMS  
767080 ALUMINUM  
(ALUMINUM OR ALUMINUMS)  
214877 FLUORIDE  
39599 FLUORIDES  
229008 FLUORIDE  
(FLUORIDE OR FLUORIDES)  
6513 ALUMINUM FLUORIDE  
(ALUMINUM(W) FLUORIDE)  
7029 ALF3  
L11 0 L10 AND (ALUMINUM FLUORIDE OR ALF3)

ACCESSION NUMBER: 1990:461673 CAPLUS  
 DOCUMENT NUMBER: 113:61673  
 TITLE: Heterogeneous catalytic reactions of  
 chlorofluorocarbons  
 AUTHOR(S): Blanchard, M.; Wendlinger, L.; Canesson, P.  
 CORPORATE SOURCE: Fac. Sci., Univ. Poitiers, Poitiers, 86022, Fr.  
 SOURCE: Applied Catalysis (1990), 59(1), 123-8  
 CODEN: APCADI; ISSN: 0166-9834

DOCUMENT TYPE: Journal

LANGUAGE: English

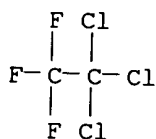
AB The reactions of 1,1,2-trichloro-1,2,2-trifluoroethane were studied on 3  
 catalysts (Cr2O3 on active charcoal, **AlF3**, and Cr2O3 on  
**AlF3**) in the presence and absence of HF. Without HF, two  
 reactions occurred, disproportionation (exchange of halogen) and  
 isomerization. With HF, fluorination was the main reaction, the  
 selectivity of which (sym. or asym. compds.) was governed by the acidity  
 of the catalyst.

IT 354-58-5P

RL: FORM (Formation, nonpreparative); **PREP (Preparation)**  
 (formation of, from trichlorotrifluoroethane in presence of chromium  
 oxide, **aluminum fluoride** and(or) hydrogen fluoride)

RN 354-58-5 CAPLUS

CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)

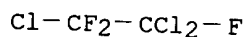


IT 76-13-1, 1,1,2-Trichloro-1,2,2-trifluoroethane

RL: **RCT (Reactant)**; RACT (Reactant or reagent)  
 (reactions of, in presence of chromium oxide and **aluminum**  
**fluoride** and hydrogen fluoride)

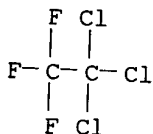
RN 76-13-1 CAPLUS

CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME)



=> d

L3 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS  
RN 354-58-5 REGISTRY  
CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)  
OTHER NAMES:  
CN 1,1,1-Trichloro-2,2,2-trifluoroethane  
CN 1,1,1-Trichlorotrifluoroethane  
CN 1,1,1-Trifluoro-2,2,2-trichloroethane  
CN 1,1,1-Trifluorotrichloroethane  
CN CFC 113a  
CN F 113a  
CN FC 113a  
CN Freon 113a  
CN Freon FT  
CN R 113a  
FS 3D CONCORD  
MF C2 C13 F3  
CI COM  
LC STN Files: ANABSTR, BEILSTEIN\*, BIOSIS, CA, CANCERLIT, CAOLD, CAPLUS,  
CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN, CSCHM,  
DETERM\*, DIPPR\*, GMELIN\*, HODOC\*, HSDB\*, IFICDB, IFIPAT, IFIUDB,  
MEDLINE, MSDS-OHS, NIOSHTIC, RTECS\*, SPECINFO, TOXCENTER, USPAT2,  
USPATFULL  
(\*File contains numerically searchable property data)  
Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
(\*\*Enter CHEMLIST File for up-to-date regulatory information)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

595 REFERENCES IN FILE CA (1962 TO DATE)  
2 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
595 REFERENCES IN FILE CAPLUS (1962 TO DATE)  
26 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

=> s cfc

L4 59 CFC

=> s cfc 113

59 CFC  
7359 113

L5 7 CFC 113  
(CFC(W)113)

=> d scan

L5 7 ANSWERS REGISTRY COPYRIGHT 2003 ACS  
IN Cyclohexane, polymer with 1,1,2-trichloro-1,2,2-trifluoroethane (9CI)  
MF (C6 H12 . C2 C13 F3)x

CI PMS

CM 1



CM 2

Cl-CF<sub>2</sub>-CCl<sub>2</sub>-F

HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):0

=> s 15 and 1/nc

43257058 1/NC

L6 1 L5 AND 1/NC

=> d

L6 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS

RN 76-13-1 REGISTRY

CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME)

OTHER NAMES:

CN 1,1,2-Trichloro-1,2,2-trifluoroethane

CN 1,1,2-Trichlorotrifluoroethane

CN 1,1,2-Trifluoro-1,2,2-trichloroethane

CN 1,1,2-Trifluorotrichloroethane

CN 1,2,2-Trichlorotrifluoroethane

CN Arcton 113

CN Arklone P

CN Asahifron 113

CN **CFC 113**

CN Daiflon 113

CN Daiflon S 3

CN Delifrene 113

CN Delifrene LS

CN F 113

CN F 113 (refrigerant)

CN FC 113

CN FKW 113

CN Fluorocarbon 113

CN Forane 113

CN Freon 113

CN Freon 113TR-T

CN Freon TF

CN Freon TS

CN Fridohna

CN Frigen 113

CN Frigen 113A

CN Frigen 113TR

CN Frigen 113TR-N

CN Frigen 113TR-T

CN Fron 113

CN Fronsolve 113

CN Fronsolve AD 9

CN Genetron 113  
 CN Halon 113  
 CN Isceon 113  
 CN Khladon 113  
 CN Ledon 113  
 CN P 113  
 CN R 113  
 CN R 113 (halocarbon)  
 CN Refrigerant 113  
 CN Refrigerant R 113  
 FS 3D CONCORD  
 DR 57762-34-2, 56996-61-3, 59948-56-0, 39349-94-5  
 MF C2 C13 F3  
 CI COM  
 LC STN Files: AGRICOLA, ANABSTR, BEILSTEIN\*, BIOBUSINESS, BIOSIS,  
 BIOTECHNO, CA, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS,  
 CHEMINFORMRX, CHEMLIST, CHEMSAFE, CIN, CSCHEM, CSNB, DDFU, DETHERM\*,  
 DIPPR\*, DRUGU, EMBASE, GMELIN\*, HODOC\*, HSDB\*, IFICDB, IFIPAT, IFIUDB,  
 IPA, MEDLINE, MSDS-OHS, NIOSHTIC, PDLCOM\*, PIRA, PROMT, RTECS\*,  
 SPECINFO, TOXCENTER, ULIDAT, USPAT2, USPATFULL, VTB  
 (\*File contains numerically searchable property data)  
 Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)

Cl-CF<sub>2</sub>-CCl<sub>2</sub>-F

\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

4760 REFERENCES IN FILE CA (1962 TO DATE)  
 31 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 4763 REFERENCES IN FILE CAPLUS (1962 TO DATE)  
 88 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

=> file caplus  
 COST IN U.S. DOLLARS

	SINCE FILE	TOTAL
FULL ESTIMATED COST	ENTRY	SESSION
	40.80	41.01

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FILE COVERS 1907 - 25 Mar 2003 VOL 138 ISS 13  
 FILE LAST UPDATED: 24 Mar 2003 (20030324/ED)

This file contains CAS Registry Numbers for easy and accurate



substance identification.

=> s 13/prep and 16/rct

595 L3  
2980858 PREP/RL  
59 L3/PREP  
(L3 (L) PREP/RL)  
4772 L6  
2503698 RCT/RL  
451 L6/RCT  
(L6 (L) RCT/RL)  
L7 18 L3/PREP AND L6/RCT

=> s 17 and (aluminum fluoride or alf3)

766854 ALUMINUM  
284 ALUMINUMS  
766914 ALUMINUM  
(ALUMINUM OR ALUMINUMS)  
214841 FLUORIDE  
39594 FLUORIDES  
228971 FLUORIDE  
(FLUORIDE OR FLUORIDES)  
6512 ALUMINUM FLUORIDE  
(ALUMINUM(W) FLUORIDE)  
7029 ALF3

L8 5 L7 AND (ALUMINUM FLUORIDE OR ALF3)

=> d ibib abs hitstr 1-5

L8 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:610344 CAPLUS

DOCUMENT NUMBER: 137:156433

TITLE: Gas-phase isomerization process and an  
**aluminum fluoride** catalyst for the  
manufacture of 1,1,1-trichloro-2,2,2-trifluoroethane  
from 1,1,2-trichloro-1,2,2-trifluoroethane  
INVENTOR(S): Cuzzato, Paolo; Bragante, Letanzio  
PATENT ASSIGNEE(S): Ausimont S.p.A., Italy  
SOURCE: Eur. Pat. Appl., 8 pp.  
CODEN: EPXXDW

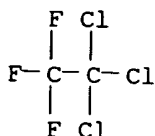
DOCUMENT TYPE: Patent  
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

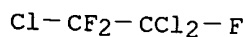
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1231196	A1	20020814	EP 2002-2131	20020129
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2002151755	A1	20021017	US 2002-72873	20020212
PRIORITY APPLN. INFO.:			IT 2001-MI287	A 20010213
AB	A gas-phase isomerization process and an <b>aluminum fluoride</b> catalyst are presented for the high-yield manuf. of 1,1,1-trichloro-2,2,2-trifluoroethane from 1,1,2-trichloro-1,2,2-trifluoroethane.			
IT	354-58-5P, 1,1,1-Trichloro-2,2,2-trifluoroethane RL: IMF (Industrial manufacture); <b>PREP (Preparation)</b> (gas-phase isomerization process and an <b>aluminum fluoride</b> catalyst for the manuf. of 1,1,1-trichloro-2,2,2-trifluoroethane from 1,1,2-trichloro-1,2,2-trifluoroethane)			

RN 354-58-5 CAPLUS  
CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 76-13-1, 1,1,2-Trichloro-1,2,2-trifluoroethane  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(gas-phase isomerization process and an aluminum  
fluoride catalyst for the manuf. of 1,1,1-trichloro-2,2,2-  
trifluoroethane from 1,1,2-trichloro-1,2,2-trifluoroethane)  
RN 76-13-1 CAPLUS  
CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:137614 CAPLUS

DOCUMENT NUMBER: 134:282447

TITLE: Conversion of 1,1,2-trichlorotrifluoroethane to  
1,1,1-trichlorotrifluoroethane and  
1,1-dichlorotetrafluoroethane over aluminum-based  
catalysts

AUTHOR(S): Bozorgzadeh, H.; Kemnitz, E.; Nickkho-Amiry, M.;  
Skapin, T.; Winfield, J. M.

CORPORATE SOURCE: Institute of Inorganic Chemistry, Humboldt University,  
Berlin, D-10115, Germany

SOURCE: Journal of Fluorine Chemistry (2001), 107(1), 45-52  
CODEN: JFLCAR; ISSN: 0022-1139

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Conversion of  $\text{CCl}_2\text{FCClF}_2$  to  $\text{CCl}_2\text{FCF}_3$  is achieved at 593-713 K under flow  
conditions using .beta.- $\text{AlF}_3$  or prefluorinated .gamma.-alumina  
as catalysts. Al-based catalysts favor the formation of asym. isomers in  
the chlorofluoroethane series, hence  $\text{CCl}_3\text{CF}_3$  is a significant product.  
More highly chlorinated materials contg. .gtoreq.4 Cl atoms, and  $\text{CCl}_2\text{F}_2\text{CF}_3$   
are minor products. Product compn. data provide evidence for a possible  
mechanism. An isomerization step is believed to be intramol. and is  
facile. The apparent fluorination step is best described as a  
dismutation.

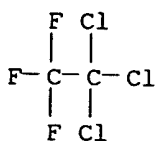
IT 354-58-5P, 1,1,1-Trichlorotrifluoroethane

RL: IMF (Industrial manufacture); PREP (Preparation)

(prepn. by trichlorotrifluoroethane conversion over aluminum-based  
catalysts)

RN 354-58-5 CAPLUS

CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 76-13-1, 1,1,2-Trichlorotrifluoroethane  
 RL: PEP (Physical, engineering or chemical process); RCT  
 (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (trichlorotrifluoroethane conversion over aluminum-based catalysts)  
 RN 76-13-1 CAPLUS  
 CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME)

Cl-CF<sub>2</sub>-CCl<sub>2</sub>-F

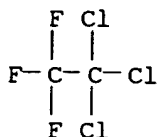
REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 3 OF 5 CAPLUS COPYRIGHT 2003 ACS  
 ACCESSION NUMBER: 1994:133825 CAPLUS  
 DOCUMENT NUMBER: 120:133825  
 TITLE: Processes using **aluminum fluoride**  
 catalyst compositions for preparing  
 1,1-dichloro-1,2,2,2-tetrafluoroethane  
 INVENTOR(S): Manzer, Leo E.; Tebbe, Frederick N.  
 PATENT ASSIGNEE(S): du Pont de Nemours, E. I., and Co., USA  
 SOURCE: U.S., 5 pp. Cont. of U.S. Ser. No. 700,190, abandoned.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5243106	A	19930907	US 1992-865784	19920407
PRIORITY APPLN. INFO.:			US 1991-700190	19910603
AB The title process comprises contacting a chlorofluoroethane with HF in the presence of title catalysts. Thus, HF, CCl <sub>2</sub> FCClF <sub>2</sub> , and Cl (5:1:1 mol ratio) was passed over an Al fluoride catalyst (prepn. given) at 375.degree. (15 s contact time) to give, inter alia, CCl <sub>2</sub> FCClF <sub>2</sub> 3.8, CF <sub>3</sub> CCl <sub>3</sub> 10.7, CClF <sub>2</sub> CClF <sub>2</sub> 1.8, and CCl <sub>2</sub> FCF <sub>3</sub> 83.3 gas chromatog. area %.				
IT 76-13-1, 1,1,2-Trichloro-1,2,2-trifluoroethane RL: RCT (Reactant); RACT (Reactant or reagent) (fluorination of, catalysts for)				
RN 76-13-1 CAPLUS				
CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME)				

Cl-CF<sub>2</sub>-CCl<sub>2</sub>-F

IT 354-58-5P, 1,1,1-Trichloro-2,2,2-trifluoroethane  
 RL: SPN (Synthetic preparation); FORM (Formation, nonpreparative);  
 PREP (Preparation)  
 (formation of, in prepn. of dichlorotetrafluoroethane)  
 RN 354-58-5 CAPLUS  
 CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



L8 ANSWER 4 OF 5 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1990:461673 CAPLUS

DOCUMENT NUMBER: 113:61673

TITLE: Heterogeneous catalytic reactions of chlorofluorocarbons

AUTHOR(S): Blanchard, M.; Wendlinger, L.; Canesson, P.

CORPORATE SOURCE: Fac. Sci., Univ. Poitiers, Poitiers, 86022, Fr.

SOURCE: Applied Catalysis (1990), 59(1), 123-8

CODEN: APCADI; ISSN: 0166-9834

DOCUMENT TYPE: Journal

LANGUAGE: English

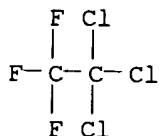
AB The reactions of 1,1,2-trichloro-1,2,2-trifluoroethane were studied on 3 catalysts (Cr2O3 on active charcoal, **AlF3**, and Cr2O3 on **AlF3**) in the presence and absence of HF. Without HF, two reactions occurred, disproportionation (exchange of halogen) and isomerization. With HF, fluorination was the main reaction, the selectivity of which (sym. or asym. compds.) was governed by the acidity of the catalyst.

IT 354-58-5P

RL: FORM (Formation, nonpreparative); **PREP (Preparation)** (formation of, from trichlorotrifluoroethane in presence of chromium oxide, **aluminum fluoride** and(or) hydrogen fluoride)

RN 354-58-5 CAPLUS

CN Ethane, 1,1,1-trichloro-2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 76-13-1, 1,1,2-Trichloro-1,2,2-trifluoroethane

RL: **RCT (Reactant)**; RACT (Reactant or reagent) (reactions of, in presence of chromium oxide and **aluminum fluoride** and hydrogen fluoride)

RN 76-13-1 CAPLUS

CN Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (8CI, 9CI) (CA INDEX NAME).

Cl-CF2-CCl2-F

L8 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1978:528721 CAPLUS

DOCUMENT NUMBER: 89:128721

TITLE: Reaction of 1,1,2-trichloro-1,2,2-trifluoroethane and other fluorohalocarbons with aluminum halides in the presence and absence of additives. Distinction in carbonium ion character and reaction conditions between substitution and isomerization